

Appl. No. 10/808,802
Arndt. dated 11/1/04
Reply to Office Action of 08/03/2004

Attorney Docket No.: N1085-90102
TSMC 2003-0186

REMARKS

Claims 1-29 are pending in the present application and each of claims 1-29 has been rejected. Claims 1, 13, 16 and 27 are amended in this paper. Applicants respectfully request re-examination, reconsideration and allowance of each of pending claims 1-29.

I. Claim rejections under 35 U.S.C. § 103(a)

In the subject Office action, specifically in paragraph 5, claims 1-29 were rejected under 35 U.S.C. § 103(a) as being unpatentable over various references as detailed below. Applicants respectfully submit that these claim rejections should be withdrawn for the reasons set forth below.

The pending claims set of claims 1-29 includes two independent claims: independent claim 1 and independent claim 16. Each of independent claims 1 and 16 has been amended to recite the distinguishing feature illustrated in Figure 3 of the application.

- * Amended Independent claim 1 recites the feature of "forming a photoresist shape including a trench-defining shape and a photoresist plug that completely fills said via opening".
- * Similarly, independent claim 16 has been amended to recite the feature of "forming a photoresist shape including a trench-defining shape and a photoresist plug that completely fills said via opening and overlies a portion of a surface of said first silicon nitride layer".

None of the cited references disclose or suggest the feature of a photoresist plug that completely fills the via opening, much less a photoresist pattern including both a trench pattern for defining a trench and a photoresist plug that completely fills the via opening.

In the subject Office action, specifically in paragraph 5, claims 1-29 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Chang in view of Nagahara. Applicants respectfully submit that these claim rejections should be withdrawn because in the Chang reference, the photoresist plug 30 only partially fills the opening as shown

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in Figure 2C. Nagahara is relied upon for providing a capping layer in conjunction with an anti-reflection layer and therefore does not make up for the above-stated deficiencies of Chang. Claims 1-29, including independent claims 1 and 16 and dependant claims 13 and 27, which have been amended for consistency with the amendments to their respective base claims 1 and 16, are therefore distinguished from the references of Chang and Nagahara, taken alone or in combination.

The subject Office action further rejects claims 1-29 under 35 U.S.C. §103(a) as being unpatentable over Harada in view of Nagahara in paragraph 6. Applicants respectfully submit that these claims rejections should be withdrawn for reasons set forth below. Similar to Chang, the cited reference of Harada provides photoresist plug 48 which does not completely fill the opening. Again, Nagahara is relied upon for providing a capping layer in conjunction with an anti-reflection layer and Nagahara therefore does not make up for the above-stated deficiencies of Harada. Claims 1-29, including independent claims 1 and 16 and dependant claims 13 and 27, amended as noted above, are therefore distinguished from the references of Harada and Nagahara.

On page 6, second paragraph of the subject Office action, claims 1-29 were further rejected under 35 U.S.C. §103(a) as being unpatentable over Stamper in view of Nagahara. Applicants respectfully submit that this claim rejection should also be withdrawn because the Office action acknowledges that Stamper fails to teach a photoresist plug: "Stamper lacks anticipation only in not teaching a photoresist plug", subject Office action, page 6, line 12. In this rejection, Nagahara is relied upon for providing a sacrificial photoresist plug to protect the via during processing. As shown most clearly in Figures 2A and 2B of Nagahara, after photoresist film 1 is formed as shown in Figure 2A, the develop process removes photoresist from the via of Figure 2B leaving only anti-reflective coating 2 to partially fill the via opening. Nagahara therefore fails to disclose or suggest the feature of a photoresist pattern including both a photoresist plug that completely fills a via opening and a trench-defining shape used to define a trench to be formed. Claims 1-29, including independent claims 1 and 16 and

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dependant claims 13 and 27, amended as noted above, are therefore distinguished from the references of Stamper and Nagahara, taken alone or in combination.

For reasons set forth above, each of amended independent claims 1 and 16 recite features neither disclosed nor suggested in the references, taken alone or in combination. Therefore, the rejection of claims 1 and 16 under 35 U.S.C. § 103(a) should be withdrawn. Claims 13 and 27 are dependent claims amended for consistency with the changes made to their base claims (claims 1 and 16, respectively). Each of dependent claims 2-15 depend from claim 1 and each of dependent claims 17-29 depend, directly or indirectly, from amended independent claim 16. The rejection of claims 2-15 and 17-29 under 35 U.S.C. § 103(a), should therefore be withdrawn.

CONCLUSION

Based on the foregoing, each of pending claims 1-29 is in allowable form and the application is therefore in condition for allowance, which action is respectfully and expeditiously requested by Applicants.

Respectfully submitted,

Dated: 01 Nov 2004



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